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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PAPPAS, PETER	

ART UNIT	PAPER NUMBER
2628	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/889,372	NAKAGAWA, JUN	
	Examiner	Art Unit	
	PETER-ANTHONY PAPPAS	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,10-12,20-22 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,10-12,20-22 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. In light of Applicant's remarks filed on 1/16/09 it is believed that the drawings filed on 1/16/09 were filed to aid in clarifying the Applicant's remarks and were not filed as formal drawings. As such said drawings have not been entered.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 21, 22 and 27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Said claims fail to fall within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example, a method (e.g., process) comprising depth cueing, varying, sorting and drawing steps is of sufficient breadth that it would be

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1 *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

2 *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

reasonably interpreted as a series of steps completely performed mentally, verbally or without a machine. It is noted that while said claims discloses an image generation system having a processor which performs the method "the mere use of the machine to collect data necessary for application of the mental process may not make the claim patentable subject matter." Comiskey, 499 F.3d at 1380 (citing In re Grams, 888 F.2d 835, 839-40 (Fed. Cir. 1989)). In other words, nominal or token recitations of structure in a method claim should not convert an otherwise ineligible claim into an eligible one.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 10-12, 20-22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al. (Computer Graphics: Principles and Practice) in view of Deering (U.S. Patent No. 6, 734, 850 B2) and further in view of Griffin (U.S. Patent No. 5, 990, 904).

6. In regard to claim 1 it is noted that the respective claim language discloses open-ended language (e.g., “comprising”) and as such said claim is not considered to be limited to only the respective disclosed limitations. Foley et al. teach an image generation system comprising: a memory which stores a program and data for image generating; at least one processor which is connected to the memory and performs

processing for image generating (p. 17, §1.6.1; p. 17, Fig. 1.5; p. 170, § 4.3.2, ¶ 1; p. 171, Fig. 4.22).

Foley et al. teach depth cueing (“The depth (distance) of an object can be represented by the intensity of the images: Parts of the objects that are intended to appear farther from the view are displayed at lower intensity ... This affect is known as depth cueing. Depth cueing exploits the fact that distance objects appear dimmer than closer objects, especially if seen through haze. Such effects can be sufficiently convincing that artists refer to the use of changes in intensity (as well as in texture, sharpness, and color) to depict distance as aerial perspective. Thus, depth cueing may be seen as a simplified version of the effects of atmospheric attenuation.” – p. 610, § 14.3.4; pp. 727, 728, §16.1.3; pp. 1044-1046, §20.8.2) such that the color of the object being more distance from a viewpoint is made closer to a target color (“…depth cueing is implemented by interpolating ... Color graphics systems usually generalize the technique to support interpolating between the color of a primitive and a user-specified depth-cue color, which is typically the color of a background." – p. 611, § 14.3.4).

It is noted the respective claim language discloses “depth cuing only for an object positioned within a depth cueing area” and that said language fails to disclose that said object is solely located within said depth cueing area. It is further noted that the respective claim language discloses “a depth cueing area” and not a "depth cueing volume." Thus, for example, a 2D portion (e.g., back clipping plane) of a given view volume in which depth cueing is performed is considered to read on a “depth cueing

area" as said respective claim language fails to disclose what exactly constitutes a "depth cueing area."

Foley et al. teach depth cueing only for an object positioned within a depth cueing area (e.g., depth cueing only for an object that is at least cut by a back clipping plane) the depth cueing area being defined as a partial subset of a viewing volume based on a position of the viewpoint and includes a backward clipping plane of the viewing volume ("For a perspective projection, the view volume is the semi-infinite pyramid … For parallel projections, the view volume is an infinite parallelepiped … At times one might want the view volume to be finite, in order to limit the number of output primitives projected on the view plane … view volume is made finite with a front clipping plane and back clipping plane ... These planes are specified ... relative to the view reference point..." – p. 239, 240, § 6.2; "...The back clipping plane is placed so as to cut through the objects being displayed ... A front clipping plane may also be used … Back-plane depth clipping can be thought of as a special case of depth cueing..." – p. 611, § 14.3.5). It is noted that said reference point is considered to read on a viewpoint and that generating a finite view volume from an infinite view volume is considered to read on creating a sub-volume (e.g., view volume) from said infinite view volume for graphic processing.

Foley et al. illustrates a depth cueing area in Color Plate II.24 and Color Plate II.25. It is implicitly taught by Foley et al. that said depth cueing area depends, at least to some degree, on a viewpoint as the respective scenes illustrated in Color Plate II.24 and Color Plate II.25 contain various graphic information displayed from a given

viewpoint. Furthermore, it is noted that said Color Plates are considered to comprise objects in both the background and the foreground.

As disclosed above Foley et al. teach that the parts of objects that are intended to appear farther from the viewer are displayed at lower intensity (p. 610, § 14.3.4). However, Foley et al. fail to explicitly teach varying an alpha value of the object so that the object being more distant from the viewpoint becomes more transparent. Deering teaches varying an alpha value of the object so that the object being more distant from the viewpoint becomes more transparent ("Another visual effect used to increase the realism of computer images is alpha blending. Alpha blending is a technique that controls the transparency of an object … Another effect used to improve realism is fogging. Fogging obscures an object as it moves away from the viewer. Simple fogging is a special case of alpha blending in which the degree of alpha changes with distance so that the object appears to vanish into a haze as the object moves away from the viewer. This simple fogging may also be referred to as 'depth cueing' or atmospheric attenuation, i.e., lowering the contrast of an object so that it appears less prominent as it recedes." – col. 2, ll. 34-51; Figs. 6, 7). Deering further teaches storing color, alpha and depth (e.g., Z) values for each vertex (col. 14, ll. 41-43; Figs. 6, 7).

Foley et al. fail to explicitly teach varying the alpha value for each vertex of the object based on Z-value for each vertex of the object and varying a depth curing value for each vertex of the object based on the Z-value for each vertex of the object. Deering implicitly teaches varying the alpha value for each vertex of the object based on, at least in part, the Z-value for each of the object because Deering teaches varying the alpha

value for each vertex of the object in response to said object moving away from a viewer and depth (e.g., Z) is one of the three coordinates (e.g., X, Y, Z) utilized by Deering for ascertaining the location of information in space (col. 2, ll. 39-40; col. 14, ll. 41-43; Figs. 6, 7). It is noted that the respective claim language fails to disclose what exactly constitutes a “depth cueing value” and thus it is noted that the combination of color information and alpha, stored for a given vertex, is considered to read on a "depth cueing value" for said vertex. Deering implicitly teaches varying a depth cueing value for each vertex of the object based on, at least in part, the Z-value for each of the vertex as said depth value is a factor in the calculation of a respective alpha value which in turn is a factor, along with color, in the calculation of a respective depth cueing effect. In other words as depth increases for an object which is moving away from a viewer alpha is changed in kind and the combination of said alpha along with respective color information (depth cueing value), as said object moves further and further away, renders the object increasingly more transparent (e.g., color of the object is brought closer to the target color as the Z-value increases).

It would have been obvious to one skilled in the art, at the time of the Applicant’s invention, to combine the teachings of Foley et al. and Deering directed toward depth cueing and atmospheric attenuation, both of which are utilized by Foley et al. and Deering, because through such incorporation it would increase the realism of the computer graphics generated by said system (“Another visual effect used to increase the realism of computer images is alpha blending…” – col. 2, ll. 34-51).

Foley et al. teach a viewing means by which rendered objects are viewed dependent on a given perspective projection, wherein the presented view of said objects change in accordance with the change of said perspective projection. The visual effect of said perspective projection is similar to that of photographic (camera) systems (p. 230-236, § 6.1). Foley et al. teach the use of a synthetic camera (p. 299-302, § 7.3.4).

Foley et al. and Deering fail to explicitly teach sorting objects so that the objects are drawn in succession starting from an object nearest to the viewpoint and drawing an image in an object space in drawing order determined by the sorting process (e.g., front to back). Griffin teaches sorting objects so that the objects are drawn in succession starting from an object nearest to the viewpoint ("…accumulation can be performed in front-to-back ... In a front-to-back approach…" – col. 42, ll. 10-67; col. 43, ll. 1-46), and performing hidden-surface erasing based on a Z-buffer process for the objects (col. 9, ll. 55-57; col. 3, ll. 48-49). Griffin implicitly teaches drawing an image in an object space in drawing order determined by said sorting process because Griffin teaches displaying accumulated graphic information (e.g., via display 142 – col. 12, ll. 46-49) wherein said accumulated graphic information is accumulated in a front-to-back manner. It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Griffin into the system taught by Foley et al. and Deering, because such incorporation would reduce the amount of memory required for the storage of the image data within the graphics system, via the use of accumulation, thus requiring less physical memory to be implemented or allocated within said graphics

system for the storage of said image data. Furthermore, Griffin teaches that the system's ability to support advanced real time animation makes it well-suited for games, educational applications, and a host of interactive applications (col. 7, ll. 1-5) and thus such incorporation would improve the flexibility in how said system is implemented.

Foley et al. teach performing hidden-surface erasing based on a Z-buffer process for the objects while drawing (e.g., scan-converting) graphic information (p. 668-672, § 15.4).

7. In regard to claim 2 Foley et al., Deering and Griffin fail to explicitly teach wherein the most distant image information displayed (e.g., background) includes a color different from said target color (e.g., user-specified depth-cue color). Official Notice is taken that both the concept and advantages of utilizing an image comprised of a plurality of different colors for a background image in a scene (e.g., in a video game) are well known and expected in the art. Thus, it would have been obvious to one skilled in the art, at the time of the Applicant's invention, for said image information utilized by Foley et al., Deering and Griffin to utilize a plurality of colors wherein a selected color may different from the colors surrounding said selected color because it would allow for the use of more realistic images and thus improve the overall display quality of the system.

8. In regard to claim 10 the rationale disclosed in the rejection of claim 1 is incorporated herein.

9. In regard to claim 11 Foley et al. teach a computer readable information storage medium encoded with a computer program (pp. 17, § 1.6.1; p. 18, § 1.6.2; pp. 165, 166,

§ 4.3; pp. 166, 167, § 4.3.1). The rationale disclosed in the rejection of claim 1 is incorporated herein.

10. In regard to claim 12 the rationale disclosed in the rejection of claim 2 is incorporated herein.

11. In regard to claim 20 the rationale disclosed in the rejection of claim 11 is incorporated herein.

12. In regard to claim 21 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.

13. In regard to claim 22 the rationale disclosed in the rejection of claim 2 is incorporated herein.

14. In regard to claim 27 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.

Response to Amendment

15. In response to Applicant’s remark in regard to the prior 35 U.S.C. 101 rejections the Applicant is directed to the respective above rejections which have been clarified to address both Applicant’s remarks and the respective amended claim language.

16. In response to Applicant's remarks that the respective cited prior art fails to teach that depth cue processing is limited within a view volume it is noted that the respective claim language fails to disclose that depth cueing is limited within a view volume but instead discloses a step in which depth cueing is performed “only for an object positioned within a depth cueing area … the depth cueing area being defined as a partial subset of a viewing volume..." (e.g., claim 1, ll. 6-9). In other words said

language fails to disclose that said object is solely located within said depth cueing area. It is further noted that the respective claim language discloses “a depth cueing area” and not a "depth cueing volume." Thus, for example, a 2D portion (e.g., back clipping plane) of a given view volume in which depth cueing is performed is considered to read on a “depth cueing area” as said respective claim language fails to disclose what exactly constitutes a “depth cueing area.” Finally, it is noted that the respective claim language discloses open-ended language (e.g., “comprising”) and as such said claim is not considered to be limited to only the respective disclosed limitations. Thus, disclosing a step in which depth cueing is performed only for an object positioned within a depth cueing area does not preclude any other depth cueing processing from being performed. In other words the respective claims are not close-ended (e.g., "An image generation system consisting:") but are in fact open-ended (e.g., "An image generation system comprising:").

Regardless, Foley et al. teach that “...The back clipping plane is placed so as to cut through the objects being displayed ... A front clipping plane may also be used … Back-plane depth clipping can be thought of as a special case of depth cueing...” (p. 611, § 14.3.5). In other words Foley et al. teach depth cueing performed only for an object positioned within a 2D area that is cut by a back clipping plane. While Foley et al. also teach that a front clipping plane may be used it is noted that the ability to utilize a front clipping plane does not necessarily mean that said front clipping plane is in fact always utilized.

17. In response to Applicant’s remarks that they disagree with the Examiner’s definition of the recited “depth cueing area” it is the position of the Examiner that their "definition," when read in light of the specification, is considered reasonable. The Examiner fails to find any support in the specification for limiting the term "area" to a "volume." As previously stated it is noted that the respective claim language discloses “a depth cueing area” and not a "depth cueing volume." Thus, for example, a 2D portion (e.g., back clipping plane) of a given view volume in which depth cueing is performed is considered to read on a "depth cueing area" as said respective claim language fails to disclose what exactly constitutes a "depth cueing area."

In response to Applicant’s remarks that “depth cueing area" is described in the specification as a “subset” of the viewing volume that includes the backward clipping plane the Examiner does not disagree with the Applicant’s position. However, the Examiner does not agree that this precludes said area from reading on a 2D area.

In response to Applicants remarks that “area” can be defined as: (1) "a section or region, as of land;" (2) "a distinct part or section, as of a building, set aside for a specific function;" and (3) "the range or scope of something" assuming one accepts these definitions said definitions fail to limit "area" to a “volume.” For example, is the Applicant suggesting that “a distinct part or section, as of a building, set aside for a specific function" cannot read on a 2D wall surface (e.g., 2D area)? It is the position of the Examiner that in the realm of mathematics, in which computer graphics is based, the term "area" is clearly defined and that "area" is not limited to reading only on a "volume."

18. Applicant's remarks have been fully considered but are not persuasive.

Conclusion

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PETER-ANTHONY PAPPAS whose telephone number is 571-272-7646. The examiner can normally be reached on M-F 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on 571-272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Peter-Anthony Pappas/
Primary Examiner, Art Unit 2628